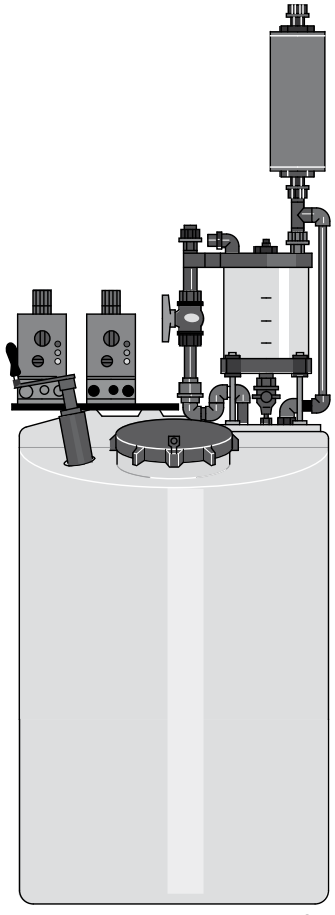
Operating instructions

Hydrazine metering systems

DULCODOS® Hydrazin



P_HYD_0001_SW

Please carefully read these operating instructions before use! · Do not discard!
The operator shall be liable for any damage caused by installation or operating errors!
Technical changes reserved.

ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5-11
69123 Heidelberg
Germany
Telephone: +49 6221 842-0
Fax: +49 6221 842-617
email: info@prominent.com
Internet: www.prominent.com

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Supplementary information

Fig. 1: Please read!

Read the following supplementary information in its entirety! Should you already know this information, you have an even greater need of the Operating Instructions.

The following are highlighted separately in the document:

- Enumerated lists

→ Instructions

Information

This provides important information relating to the correct operation of the system or is intended to make your work easier.

Safety information

Safety information is identified by pictograms - see Safety Chapter.

Notes for the System Operator

This document includes notes and quotes from German guidelines relating to the system operator's scope of responsibility. This information does not discharge operators from their responsibility as an operator and is intended only to remind him or make him aware of specific problem areas. This information does not lay claim to being complete, nor applicable to every country and every type of application, nor to being unconditionally up-to-date.

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1 List of other applicable documents

Dependent on your order, you will find the following applicable documents in the appendix to these operating instructions:

Title
Operating Instructions Beta® b BT4b and BT5b Solenoid Metering Pump
General operating instructions for ProMinent solenoid metering pumps

2 Type list with performance data

Hydrazine metering systems DULCODOS® Hydrazin

Pump data

Chemical feed container volume	Metering pump capacity	Back pressure, max.	Decanting pump capacity flow	Part no.
l	l / h	bar	l / h	
140	7.1	7.0	approx. 17	913018
250	11.0	7.0	approx. 32	913019

3 About the Product

Hydrazine is used as an oxygen binding agent in hot water and steam generators to prevent corrosion. The hydrazine metering systems DULCODOS® Hydrazin are used for manual batching and automatic metering of diluted hydrazine solutions. They are a range of closed hydrazine systems, built according to the specifications set out in BGG 907 (edition 1999; sections "Recognised Systems", page 4, and "Retrofitting Systems ... ", page 5, are invalid).

4 Safety chapter

Explanation of the safety instructions

The following signal words are used in these operating instructions to denote different severities of danger:

Signal word	Meaning
WARNING	Denotes a possibly dangerous situation. If this is disregarded, you are in a life-threatening situation and this can result in serious injuries.
CAUTION	Denotes a possibly dangerous situation. If this is disregarded, it could result in slight or minor injuries or material damage.

Warning signs denoting different types of danger

The following warning signs are used in these operating instructions to denote different types of danger:

Warning signs	Type of danger
	Warning – toxic substances.
	Warning – danger zone.

Correct and proper use

- DULCODOS® Hydrazin metering systems are only intended for the preparation of hydrazine-water solutions and as corrosion inhibitors for use in water-steam circuits or steam and condensate systems.
- DULCODOS® Hydrazin metering systems may only be used after correct installation and commissioning - according to the technical data and specifications which are detailed in these operating instructions and the operating instructions of the individual components.
- All other uses or a modification of the system are only permitted with the written authorisation of ProMinent, Heidelberg.
- DULCODOS® Hydrazin metering systems may not be used in hazardous locations.
- DULCODOS® Hydrazin metering systems are not intended for the dosing of gaseous media, solid media or other liquid media.
- DULCODOS® Hydrazin metering systems are not intended for unprotected outside use.
- You are obliged to observe the information contained in the operating instructions at the different phases of the device's service life (such as assembly, installation, etc.).
- The dosing systems should only be operated by trained and authorised personnel, see the table.

Qualification of personnel

Activity	Qualification level
Storage, transport, unpacking	Technical personnel
Assembly, installation of hydraulic system	Technical personnel
Installation, electrical	Technical personnel, electrician recommended
Start up	Technical experts or authorised technical personnel

Activity	Qualification level
Operation	Instructed person
Maintenance	Technical personnel and instructed personnel, depending on task
Repairs	Technical personnel
Troubleshooting	Technical personnel
Decommissioning / Disposal	Technical personnel

Technical personnel

A qualified employee is deemed to be a person who is able to assess the tasks assigned to him and recognise possible dangers based on his/her technical training, knowledge and experience, as well as knowledge of pertinent regulations. Such persons are knowledgeable in handling hydrazine metering systems for hydrazine/levoxine solutions. Such persons are familiar with health and safety regulations as well as all other generally acknowledged safety regulations.

Technical experts

A technical expert is deemed to be a person who is able to assess the tasks assigned to him and recognize possible hazards based on his/her technical training and experience, as well as knowledge of applicable regulations. Such persons have experience in handling hydrazine metering systems for hydrazine/levoxine solutions. Such persons are familiar with health and safety regulations as well as all other generally acknowledged safety regulations.

Instructed person

An instructed person is deemed to be a person who has been instructed and, if required, trained in the tasks assigned to him/her and possible dangers that could result from improper behaviour, as well as having been instructed in the required protective equipment and protective measures.

Electrical technician

Electrical technicians are deemed to be people, who are able to complete work on electrical systems and recognize and avoid possible dangers independently based on their technical training and experience, as well as knowledge of pertinent standards and regulations.

Electrical technicians should be specifically trained for the working environment in which the are employed and know the relevant standards and regulations.

Electrical technicians must comply with the provisions of the applicable statutory directives on accident prevention.

Sound pressure level

The sound pressure level is < 70 dB (A)

According to DIN EN ISO 3743-1

Safety notes

CAUTION!

Danger due to insufficient information

Disregarding the operating instructions for the metering pump and other possible units can lead to potentially hazardous situations.

Please observe the operating instructions for the metering pump and any other units which may be fitted.

NOTICE!

Warning of illegal operation

Observe the regulations that apply where the device is installed.

Safety Equipment

Which safety equipment is available and how it is tested, is contained in the "Start up" chapter.

Information in the event of an emergency

In the event of an electrical emergency or if the solution escapes from the system during pumping, disconnect the mains power supply!

Consult the chemical supplier's safety data sheet or the "Hydrazine / levoxine 15%" summary at the end of the operating instructions for all accidents involving hydrazine / levoxine.

If hydrazine / levoxine is released, evacuate the room, put on protective equipment, seal the leakage and remove and dispose of leaked solution, if required!

Personal protective equipment

- see the chemicals supplier’s safety data sheet on hydrazine / levoxine or the compilation “Data on hydrazine / levoxine 15%” at the end of the operating instructions

Health hazards

- see the chemicals supplier’s safety data sheet on hydrazine / levoxine or the compilation “Data on hydrazine / levoxine 15%” at the end of the operating instructions

First aid instructions

- See the compilation “Data on hydrazine / levoxine 15%” at the end of the operating instructions and the enclosed red leaflet "Technical data sheet M 011, Hydrazine" paragraph 8

Note for the system operator

Keywords when searching for the necessary regulations:

- Hydrazine systems
- Hydrazine
- Storage
- Dangerous substances
- Personal protective equipment
- Water protection
- Air protection

The following regulations apply, e.g. in Germany:

- Leaflet "Hydrazine", M 011, BG-Chemie, 06/95, published by Jedermann-Verlag Dr. Otto Pfeffer oHG, Heidelberg
- "BG basic rules: Admission of closed decanting and metering systems ...“, BGG 907, HVBG, published by Carl Heymanns Verlag, Cologne, updated edition of 1999

- BGI 504-40h (ZH 1/600.40h), Selection criteria for special preventive occupational medical care according to Employer's Liability Insurance Association principle G 40 "carcinogenic hazardous substances – general“, specifically: Hydrazine, Berufsgenossenschaftliche Zentrale für Sicherheit und Gesundheit, committee INDUSTRIAL MEDICINE, 1998, in cooperation between HVBG and Carl Heymanns Verlag, 2005
- BGV A4 preventive occupational medical care (formerly VBG 100) of 1 April 1993 1/ edition 1 January 1997, cooperation between HVBG and Carl Heymanns Verlag
- The directives for the protection of ground water against pollution (section 19 of the German Federal Water Act (WHG)
- The German Ordinance on Hazardous Substances (GefStoffV) - especially section 17 (general duty of protection) and section 20 (operating instructions; see also Accident Prevention Regulations section 9)

Labelling

The operator must classify and label all storage tanks according to the concentration of hydrazine contained in them.

5 Storage, transport, unpacking

Safety notes

WARNING!

Warning of toxic hydrazine

Hydrazine can escape in the event of damage.

- Prior to storage or transport, the dosing system must be free from hydrazine.
- The metering system must be carefully protected against mechanical damage, so that during subsequent operation no one can be endangered by escaping, toxic hydrazine.

WARNING!

Only return metering pumps for repair in a cleaned state and with a flushed liquid end - refer to the section on decommissioning!

Only send metering pumps with a filled in Decontamination Declaration form. The Decontamination Declaration constitutes an integral part of an inspection / repair order. A unit can only be inspected or repaired when a Declaration of Decontamination Form is submitted that has been completed correctly and in full by an authorised and qualified person on behalf of the pump operator.

The "Decontamination Declaration Form" can be found in the Appendix or at *www.prominent.com*.

NOTICE!

Danger of material damage

The device can be damaged by incorrect or improper storage or transportation!

- The device should only be stored or transported in a well packaged state - preferably in its original packaging.
- The packaged unit should also only be stored or transported in accordance with the stipulated storage conditions.
- The packaged unit should be protected from moisture and the ingress of chemicals.

Ambient conditions

Data	Value	Unit
Storage and transport temperature	+5 ... +50	°C
Maximum air humidity *	92	% rel. humidity

* non-condensing

6 Overview of equipment and control elements

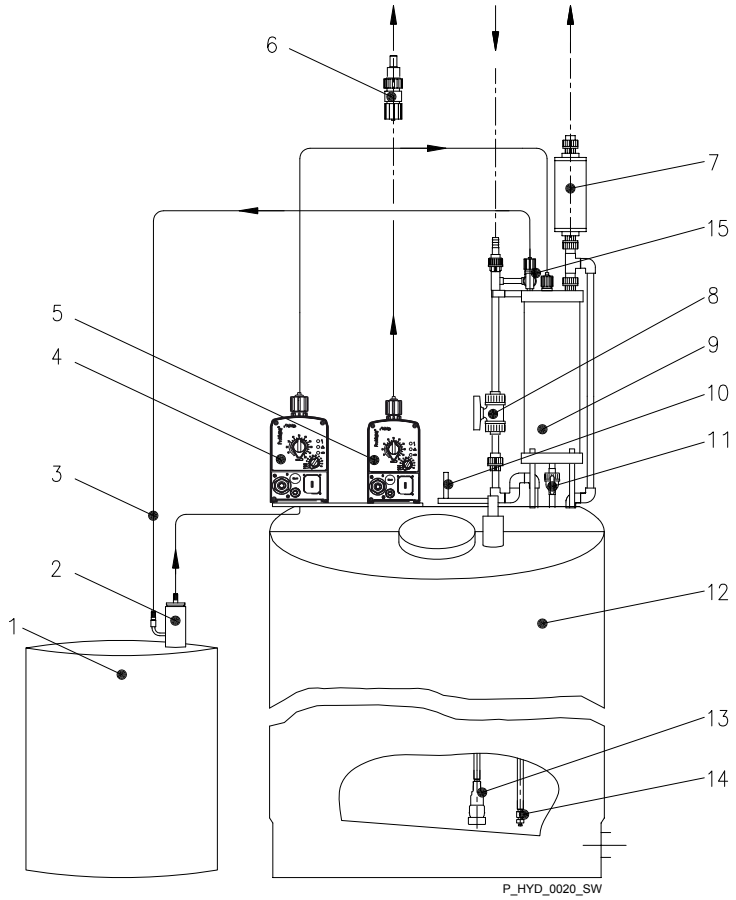

Fig. 2: Overview of equipment metering system DULCODOS® Hydrazin

1	Storage tank with connector for coupling (accessories)
2	Coupling (accessories)
3	Vapour recovery line
4	Decanting pump (with control elements)
5	Metering pump for metering (with control elements
6	Injection valve
7	Vent filter
8	Stopcock 1 (for diluting water)
9	Metering container with level switch
10	Manual stirrer
11	Stopcock 2 (for hydrazine in metering container)
12	Chemical feed container with sprinkler
13	Suction assembly
14	Chemical feed container level switch
Not shown in figure	Collecting pan
Not shown in figure	Flushing equipment (accessories. connector for coupling)

7 Functional description

The hydrazine solution is prepared semi-automatically: After the operator opens stopcock 1, the diluent water flows through it and a sprinkler to the chemical feed container. The transfer pump pumps the hydrazine from the on-site storage tank to the dosing tank until the level switch there responds. (The transfer pump is stopped in the event that level switch min. in the storage tank responds.) After stopcock (2) has been opened, the measured quantity flows into the chemical feed container. The operating personnel use the manual stirrer to create a homogeneous solution.

The metering pump meters the hydrazine solution via the injection valve into the desired pipework. Metering can be precisely controlled via the external control of the metering pump.

The vapour recovery line enables decanting in the closed system. The discharge air filter breaks down escaping hydrazine into ammonia. A vent line transports the ammonia out of the building.

A collecting pan must prevent toxic hydrazine from discharging into the environment in the event of a leak. A leakage probe in the collecting pan can be used to trigger an alarm.

8 Assembly

Safety notes

WARNING!

Warning of toxic hydrazine

If the system is not handled correctly, hydrazine can escape.

– Store and transport the metering system in its original packaging. Take special precautions to ensure the metering system is protected against mechanical damage
– Select a suitable installation site for the hydrazine metering system.

WARNING!

Danger of severe eye injuries

In case of contact of hydrazine with the eyes, facilities must be provided to permit immediate rinsing of the eyes.

– A water connection with an eye bath must be placed immediately alongside the system installation site. If drinking water is used, the connection must be installed according to DIN 1988!

Requirements for the installation site

The following must be available at the installation site:

1 - Water connection with eye bath

1 - Water connection for deionised water (diluting water and rinsing water)

2 - Mains power sockets for both metering pumps

1 - Leak-tight pan provided by the customer around the installation location and suitable for hydrazine or a collecting pan - see "Accessories" chapter

- The installation location must be in a closed room with good ventilation.
- The site of the hydrazine system must be protected against sun, frost-proof and well ventilated.
- The exhaust air must be able to rise upwards and outdoors or into a vent line.
- It must be possible to fit the flushing adapter.
- A horizontal, smooth and stable surface must be available for the installation.
- It must be possible to fasten the system so that it is unable to topple.
- The installation location must be selected to ensure that the system cannot be damaged mechanically, e.g. resulting from internal traffic. If necessary, mount a guard plate.
- The installation location must be selected to ensure that the system cannot be flooded.
- It must be possible to transport the storage tank to the system without obstruction.

9 Installation

9.1 Installation, hydraulic

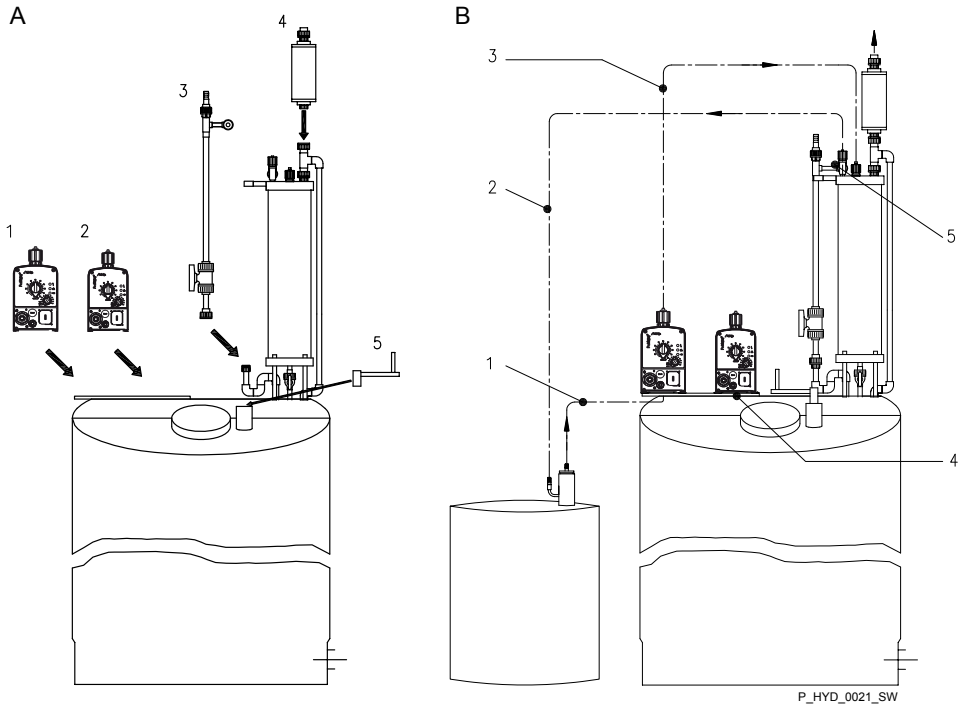

Fig. 3: A. Screw parts together, B. make the internal piping connections

1. Assemble the supplied parts of the hydrazine dosing system and screw together with the connectors of the chemical feed container to form a tight fit - see Fig. 3 A.

   1. - Decanting pump
   2. - Metering pump.
   3. - Diluting water feed
   4. - Activate carbon filter. Also secure using the metal angle!
   5. - Hand crank

2. Make the internal piping connections - see Fig. 3 B.

   1. - Decanting pump suction line for the storage tank. Use hose clips as necessary!
   2. - Vapour recovery line from the dosing tank for the storage tank. Use hose clips as necessary!
   3. - Decanting line from the decanting pump to the metering container
   4. - Suction line of the metering pump

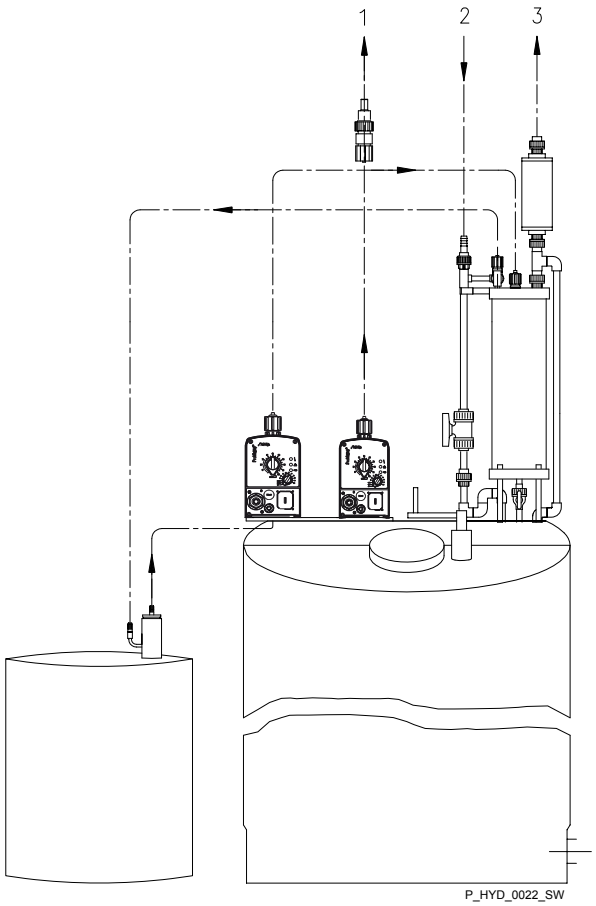

Fig. 4: Make external piping connections

3. Make the external piping connections - see Fig. 4.

WARNING!
Warning of toxic hydrazine
The system can overflow in the event of backflow from the main line.

– Install an injection valve or vacuum breaker.

WARNING!
Warning of toxic hydrazine vapour
Hydrazine vapour can escape in the event of a problem with the active carbon filter at the installation site.

– Lay an exhaust line leading outdoors from the active carbon filter.
– The exit point of the exhaust air line is to be aligned so that it is not directly accessible and so that foreign bodies cannot penetrate inside.
– The exhaust air line must be subsequently accessible for inspection.

1. - Metering line from the metering pump to the installed injection valve
2. - Diluting water line of the diluting water supply to the water line
3. - Exhaust line leading outdoors from the active carbon filter
4. - Flushing water line for the flushing adapter to the water supply (not illustrated)

4. Install the flushing adapter.

- Mount the flushing adapter to the wall.
- Connect the flushing adapter to the diluting water stopcock.

9.2 Installation, electrical

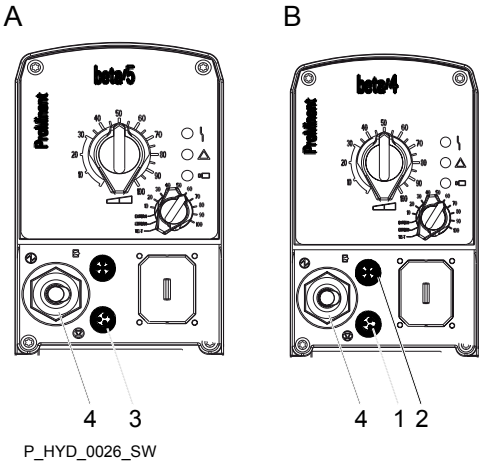

Fig. 5: Undertake the electrical installation for (A) the transfer pump and (B) metering pump

Make the electrical cabling connections - see Fig. 5.

1. - Insert the plug of the suction lance level switch (chemical feed container) in the "Level switch connector" at the metering pump.
2. - Plug the signal cable from a control into the "External operating modes connection" at the metering pump.
3. - Insert the plug of the decanting vessel level switch in the "Level switch connector" at the decanting pump.
4. - Only for collecting pan with leakage probe: Undertake the electrical installation for the leakage probe so that an alarm is triggered in the event of a leak.
5. - Install an emergency cut-off switch for both pumps.
6. - Connect both mains cables to the mains outlets.

10 Adjustment

1. Set the decanting pump to 100% stroke length - while it is running and to 100 % stroke rate
2. Match the metering pump (for dosing) using the stroke length (stroke length adjustment knob) and the stroke frequency (multi-functional switch) to the process conditions - see also "Operating Instructions metering pumps Beta BT4 and BT5."

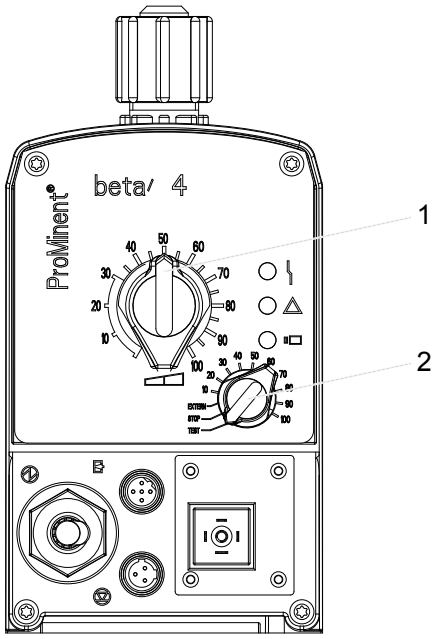

Fig. 6: Pump adjustment

1 Stroke length adjustment knob
2 Multifunctional switch

11 Start up

Safety notes

WARNING!

Toxic hydrazine can escape

Toxic hydrazine can escape If the system is not handled correctly.

- Only technical experts or authorised technical personnel may start up the system!
- The accepting technical expert or authorised technical personnel must verify acceptance of the hydrazine metering system for the operator by means of the "acceptance test certificate" - see appendix for copy.

List of safety equipment

- Coupling for storage tank (e.g. Micro-Matic coupling) and flushing adapter
- Vapour recovery line
- Active carbon filter with exhaust air line (the latter is to be provided on-site)
- Tank cover with seal
- Labels on tank cover
- Injection valve or vacuum breaker (the latter is to be provided on-site)
- Collecting pan (to be provided on-site), leakage sensor recommended
- Guard plate (optional, to be provided on-site)
- Emergency stop switch (to be provided on-site)

Safety equipment test

The system must be flushed prior to undertaking most tests!

Most of the safety equipment is tested in *Chapter 11 'Start up' on page 20* and *Chapter 11 'Start up' on page 20*. In addition:

- Tank cover seal
  Test: Is the seal intact and firmly screwed to the tank cover?
- Label on tank cover
  Test: Is the label still attached and easily legible?
- Active carbon filter
  Test: Not possible. Exchange bi-annually.
- Injection valve or vacuum breaker
  Test: Release the discharge line on the metering pump and observe if liquid is forced back.
- Collecting pan (to be provided on-site)
  Test: Fill with water and check for water tightness. Subsequently remove the water again!
- Guard plate (optional)
  Test: Check to ensure it is still sufficiently sturdy.
- Emergency stop switch (to be provided on-site)
  Test: Press the emergency stop switch while the pump is in operation. The pump must come to a standstill.

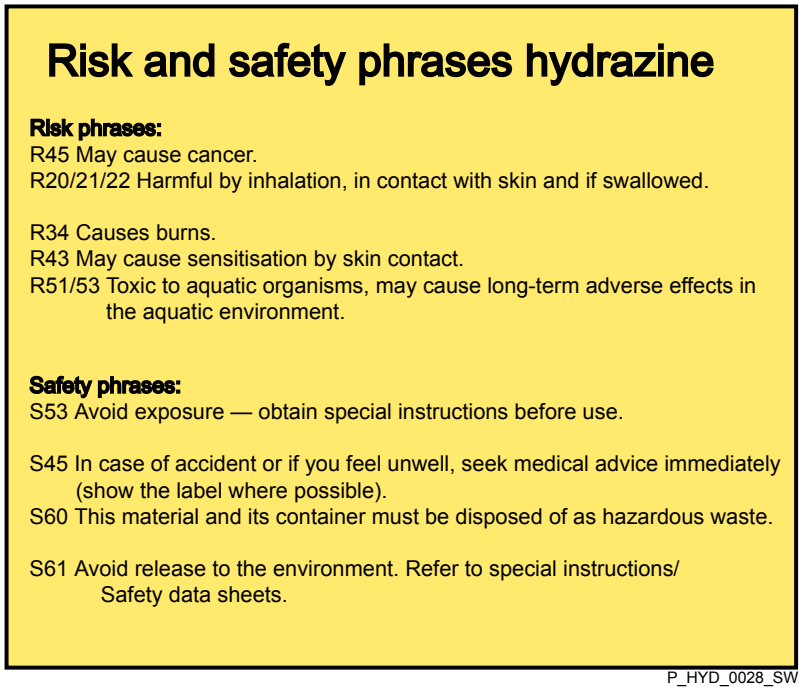
Risk and safety phrases hydrazine
Risk phrases:
R45 May cause cancer.
R20/21/22 Harmful by inhalation, in contact with skin and if swallowed.
R34 Causes burns.
R43 May cause sensitisation by skin contact.
R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
Safety phrases:
S53 Avoid exposure — obtain special instructions before use.
S45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
S60 This material and its container must be disposed of as hazardous waste.
S61 Avoid release to the environment. Refer to special instructions/ Safety data sheets.
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Fig. 7: Label on tank cover

Checking for cleanliness

CAUTION!
Warning catalytic decomposition
Soiling can trigger catalytic decomposition in combination with hydrazine.

– Check that the system is free of soiling.

→ Check that the system is free of soiling.

Undertaking initial commissioning

→ Initial commissioning together with the acceptance test is undertaken in Germany in accordance with the principles set out in "Admission of closed decanting and metering systems for aqueous solutions of hydrazine", according to BBG-907/1999.

Checking for leak-tightness

1. → If hydrazine has already been present in the system, flush it out - see chapter "Decommissioning".
2. → Carefully meter the resulting solution into the application.
3. → Close the active carbon filter with a blanking cap.
4. → Close the screw lid on the chemical feed container.
5. → Open the stopcock on the metering container.
6. → Close the stopcock for diluting water.
7. → Remove the threaded connector at the diluting water connection.
8. → Screw the T-piece with manometer and compressed air connector on to the diluting water connector of the hydrazine metering system.
9. → Adjust the pressure reduction valve of the compressed air supply to a test pressure of 80 mbar.

10. Open the diluting water stopcock and fill the complete hydrazine metering system with compressed air until the manometer displays a constant 80 mbar. Close the stopcock on the testing fitting. The test duration is 5 minutes.
11. Check the chemical feed container of the hydrazine metering system at the closed screw lid as well as the stirrer and its container penetration for leaks (leak spray).
12. Check the fastening points for the foot valve support pipe and the level switch as well as the penetrations for the suction lines and the level switch cable for leaks.
13. Check the container flange for the metering container at the flange location and the attachment screws for leak-tightness as well as the penetrations for the diluting water lines, the aerating and vent lines and the filling line (with stopcock).
14. Check the container over the complete top part and the fastening points of the fastening plate mounting of the metering and decanting pumps for leak-tightness.
15. Check the container and container bottom for cracks or other damage and leak-tightness.
16. Check all the gluing points for leak-tightness, over all the piping, threaded connectors and piping connections, on the metering container.
17. Check all threaded connectors for leak-tightness:
    - at the stopcocks
    - at the stopcock
    - on the diluting water line
    - at the active carbon filter
    - at the metering container, also the float pots of the level switches
18. Check the housing of the active carbon filter for leak-tightness.
19. Check the vapour recovery line for leak-tightness at the connectors, the metering tank and the suction line of the transfer pump as well as the test tank connection.
20. The pressure must not have fallen by more than 10 mbar after a test duration of 5 minutes has expired.
21. Remove the blind cap on the active carbon filter and hook up the exhaust air line again.

Operational test using diluting water

1. Close the bottom stopcock on the metering container and connect the diluting water line.
2. Fill the chemical feed container through the diluting water line up to the maximum level (140 l or 250 l marking), dependent on the container size.
3. Close the diluting water stopcock.
4. Completely fill the test tank (empty hydrazine supply tank) with rinsing water, e.g. condensate or deionised water.
5. Check the operation of the decanting pump as well as its switching off via the level switch in the metering container: Switch on the decanting pump and fill the metering container, until the level switch switches and the decanting pump stops. Simultaneously check the parts such as the decanting pump, suction line, line to the metering container and the metering container itself for leak-tightness. Finally re-close the stopcock once more.
6. Metering pump dosing function test: Switch on the metering pump and vent the liquid end (see "Operating Instructions solenoid metering pump Beta® BT4 and BT5"). While doing this, check the metering pump, metering line and the injection valve and its fastening point for leaks. Finally switch off the metering pump.

7. Replace the test tank with a storage tank, once the Micro-Matic coupling has been removed. When doing so, ensure that prior to placing the coupling on the storage tank, the suction line and the vapour recovery line are fastened to the coupling with hose clips. Ensure the line connectors are securely seated and check for leaks.

8. After commissioning the hydrazine metering system, also carry out one more complete visual inspection to ensure ultimate safety.

Acceptance test certificate

→ The accepting personnel (technical expert or authorised technical personnel) must verify acceptance of the hydrazine metering system for the operator by means of the "acceptance test certificate" (see appendix for "Acceptance Test Certificate" template).

The hydrazine metering system can be released for operation if all of the points detailed in the acceptance test are fulfilled during initial commissioning.

12 Operation

Batching hydrazine solution

WARNING!

Toxic hydrazine solution can escape

If batching of hydrazine solution takes place without supervision, hydrazine solution can be ejected from the system under pressure

– Because batching takes place in manual mode, it must be monitored from start to finish.

WARNING!

Toxic hydrazine vapours may escape.

If the lid of the chemical feed container is open, hydrazine vapour will escape.

– The lid of the chemical feed container must not be opened.

1. Open diluting water stopcock 1 (2) and initially third-fill the chemical feed container.
2. Using the multifunctional switch (1), switch the transfer pump from "stop" to "100", so that hydrazine is pumped from the storage tank into the metering container (3). When the maximum liquid level is reached, the level switch turns the decanting pump off.
3. Using the multifunctional switch (2), switch the transfer pump from "100" to "stop" so that when emptying the metering container (3) no unwanted hydrazine is metered out.
4. Simultaneously open the stopcock 2 (5) at the bottom of the chemical feed container and stopcock 1 (2) for diluent water – hydrazine flows into the metering tank and at the same time a mist of diluent water condenses evaporated hydrazine.
5. As soon as the maximum filling level has been reached (marking 140 l or 250 l depending on the size of tank), close both stopcocks.
6. Use the manual stirrer (4) to stir for approximately 15 s to ensure a homogeneous solution.

   ⇨ The metering pump can now meter the hydrazine solution into the application.

Adjusting the capacity

The capacity can be adjusted using both the stroke rate (multifunctional switch) and the stroke length (see the attached "Operating Instructions Beta® BT4 and BT5 Solenoid Metering Pump").

Replacing the storage tank

WARNING!

Drops of toxic hydrazine could be released

When changing the storage tank, it can occur that drops of hydrazine are spilt.

– When carrying out any work on the system, wear tightly fitting safety glasses and suitable safety gloves!

WARNING!

Toxic hydrazine can escape

If the storage tank is not handled correctly, hydrazine can escape.

- Return any empty multi-use drums to the supplier!
- Dispose of any unrinsed single-use drums correctly!

As soon as the storage tank is empty, replace it with a new original storage tank (the following description is for a Micro-Matic coupling):

1. Unscrew the protective cap from the new storage tank.
2. Push up the release handle on the Micro-Matic coupling on the old storage tank.
3. Unscrew the Micro-Matic coupling in an anticlockwise direction from the valve on the connecting piece.
4. Place the Micro-Matic coupling with the 3 cams on the valve at the connecting piece and turn clockwise until it engages and stops.
5. Press the handle of the Micro-Matic coupling to the bottom such that the spring steel bracket at the coupling engages. The valve is now opened.
6. Seal the suction connection on the empty storage tank with the protective cap.
7. Return the empty storage tank to the supplier or a waste management firm.

13 Maintenance

Safety notes

WARNING!

It is mandatory that you read the safety information and specifications in the "Storage, Transport and Unpacking" chapter prior to shipping the pump.

WARNING!

Toxic hydrazine can escape

Hydrazine may escape when carrying out the work listed below.

– When carrying out any work on the system, wear tightly fitting safety glasses and suitable safety gloves!

WARNING!

Toxic hydrazine vapours may escape.

If the chemical feed container or the storage tank must be opened, toxic hydrazine vapours will escape.

– If the metering tank or the storage tank have to be opened, respiratory equipment independent of the ambient air and with filter cartridge K (identification colour green) must be worn! See the chemicals supplier’s safety data sheet or the compilation “Data on hydrazine / levoxine 15 %” at the end of the operating instructions.

Maintenance work

Interval	Maintenance work	Personnel
Annually	Check the hydrazine metering system to ensure it is in good condition.	Technical personnel
	Check the hydrazine metering system for leak-tightness - see chapter "Start up".	Technical personnel
	Exchange the diaphragms for the metering and transfer pumps.	Technical personnel
	Undertake the acceptance test for the hydrazine metering system. This is to be verified by means of the "Acceptance Test Certificate" - see "Appendix".	Technical personnel
Bi-annually	Exchange the active carbon filter - see section "Maintenance of active carbon filter" below.	Technical personnel
Twice per year	Exchange the relief valve diaphragm - see operating instructions for relief valve.	Technical personnel
daily	Check the hydrazine metering system to ensure it is in good condition (visual inspection).	Instructed personnel
	Check the hydrazine metering system for leaks (visual inspection).	Instructed personnel

Maintenance of active carbon filter

WARNING!

Toxic hydrazine can escape

Hydrazine may escape when carrying out the work listed below.

- Therefore always flush the system, see chapter "Decommissioning and disposal"!
- Refit the new active carbon filter to the metal bracket, so that it cannot break off!
- Dispose of the used active carbon filter in a proper manner.

1. Flush the hydrazine metering system, see chapter "Decommissioning and disposal".
2. Dismantle the used active carbon filter.
3. Mount the new active carbon filter.
4. Refit the new active carbon filter to the metal bracket, so that it cannot break off!
5. Re-connect the exhaust air line.
6. Dispose of the used active carbon filter in a proper manner.

14 Repairs

WARNING!

It is mandatory that you read the safety information and specifications in the "Storage, Transport and Unpacking" chapter prior to shipping the pump.

WARNING!

Toxic hydrazine / levoxine can escape

Hydrazine / levoxine may escape when carrying out the work listed below.

- Therefore always flush the system, see chapter "Decommissioning and disposal"!
- When carrying out any work on the system, wear tightly fitting safety glasses and suitable safety gloves as recommended in the safety data sheets.
- If the chemical feed container or the storage tank have to be opened, respiratory equipment independent of the ambient air and with filter cartridge K (identification colour green) must be worn! See appendix: chemicals supplier’s safety data sheet or the compilation “Data on hydrazine / levoxine 15 %”.
- Only use the correct, high quality original spare parts.
- Upon completion of the work, check the system for leaktightness and log the results.

15 Troubleshooting

WARNING!

Toxic hydrazine / levoxine can escape

Hydrazine / levoxine may escape when carrying out the work listed below.

- Therefore always flush the system, see chapter "Decommissioning and disposal"!
- When carrying out any work on the system, wear tightly fitting safety glasses and suitable safety gloves as recommended in the safety data sheets.
- If the chemical feed container or the storage tank have to be opened, respiratory equipment independent of the ambient air and with filter cartridge K (identification colour green) must be worn! See appendix: chemicals supplier’s safety data sheet or the compilation “Data on hydrazine / levoxine 15 %”.
- Only use the correct, high quality original spare parts.
- Upon completion of the work, check the system for leak-tightness and log the results.

If necessary refer to the metering pump operating instructions and the instructions for the relief valve when troubleshooting.

16 Decommissioning and disposal

Decommissioning

WARNING!

Toxic hydrazine / levoxine can escape

The hydrazine metering system contains at least the residues of hydrazine / levoxine.

- Flush the system with diluting water - see "Flushing the system".
- Take suitable protective measures - see appendix: chemicals supplier's safety data sheet or the compilation "Data on hydrazine / levoxine 15 %" in the appendix.

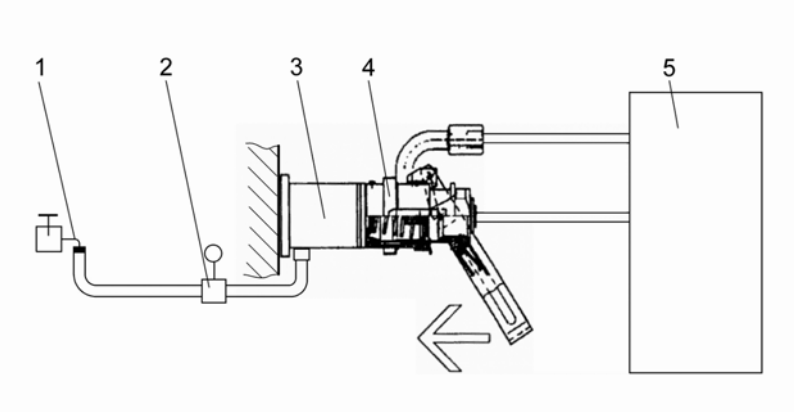

Fig. 8: Flushing the system

1 Stopcock (rinsing water)
2 Pressure reducer (max. 2 bar)
3 Flushing adapter
4 Micro-Matic coupling
5 Hydrazine system

Flushing the system

1. First remove the Micro-Matic coupling from the vessel and place it on the flushing adapter.
2. Completely fill the metering container with water at least twice and drain into the chemical feed container via the ball valve.
3. Carefully meter the resulting solution into the process.

Thereafter, the decanting pump can, for example, be removed.

Disposal

WARNING!

Toxic hydrazine / levoxine can escape

The hydrazine metering system contains at least the residues of hydrazine / levoxine.

- Flush the system with diluting water - see *'Decommissioning' on page 30*.
- Dispose of the diluting water correctly!
- Wear tightly fitting safety glasses and suitable safety gloves!
- If the chemical feed container or the storage tank have to be opened, respiratory equipment independent of the ambient air and with a suitable filter cartridge must be worn in addition to tightly closing goggles and suitable gloves (recommendation: filter cartridge K (identification colour green) - see appendix: chemicals supplier's safety data sheet or the compilation "Data on hydrazine / levoxine 15 %" in the appendix.

CAUTION!

Warning against non-observation of disposal regulations

Non-observation of disposal regulations can lead to environmental damage or problems with the authorities.

– Note the pertinent regulations currently applicable in your country!

CAUTION!

Warning against incorrect disposal

Incorrect disposal can lead to environmental damage or problems with the authorities.

– Please also observe the operating instructions for the metering pumps and relief valves.

17 Technical data

Safety notes

CAUTION!

Warning against operation with insufficient technical data

Incomplete technical data could result in problems occurring during operation of the hydrazine metering system.

– Also observe the operating instructions for "Solenoid metering pumps Beta® BT4 and BT5".

17.1 Technical data for the complete system

Dimensions and weights, dosing system with 140 l

Data	Value	Unit
Width	520	mm
Height	1,650	mm
Depth	600	mm
Net weight, approx.	23	kg
Gross weight, approx.	160	kg
Diluting water connector. hose nozzle	DN10	
Operating pressure diluting water, max.	3	bar

Dimensions and weights, dosing system with 250 l

Data	Value	Unit
Width:	650	mm
Height:	2,120	mm
Depth	650	mm
Net weight, approx.:	35	kg
Gross weight, approx.:	280	kg
Diluting water connector. hose nozzle:	DN10	
Operating pressure diluting water, max.:	3	bar

Ambient conditions

Data	Value	Unit
Storage and transport temperature	+5 ... +50	°C
Ambient temperature during operation:	+5 ... +40	°C
Feed chemical temperature:	+5 ... +35	°C
Maximum air humidity *:	92	% rel. humidity

* non-condensing

Pump data

Chemical feed container volume	Metering pump capacity	Back pressure, max.	Decanting pump capacity flow	Part no.
l	l / h	bar	l / h	
140	7.1	7.0	approx. 17	913018
250	11.0	7.0	approx. 32	913019

Degree of protection

Protection against contact and humidity:

IP 65 in accordance with IEC 529, EN 60529, DIN VDE 0470 Part 1

Sound pressure level

The sound pressure level is < 70 dB (A)

According to DIN EN ISO 3743-1

17.2 Materials and properties of the components

Hydrazine metering system, 140 l

1 - ProMinent® metering pump Beta® BT4b0708NPE000UA000000, capacity 7.1 l/h at max. back pressure 7.0 bar. You can find more detailed information in your operating instructions.

1 - ProMinent® metering pump Beta® BT5b0420NPE000UA000000, as decanting pump, capacity 17.1 l/h at max. back pressure 4 bar. You can find more detailed information in your operating instructions.

1 - PE chemical feed container, volume 140 l, with litre scale and closable screw lid, "gas-tight version"

1 - Complete PVC suction assembly, "gas-tight version" (installed in the chemical feed container)

1 - Electrical level switch with support pipe (installed in the chemical feed container)

1 - PVC manual stirrer, "gas-tight version"

1 - Fastening plate for mounting the metering pumps on the container

1 - Metering container, PVC-transparent, volume 2 l, with electrical level switch for switching off the decanting pump upon reaching of a high level as well as the necessary hoses

1 - Active carbon filter

1 - PVC ball valve, d16, NW10 with piping

1 - 1.4571 stainless steel injection valve , connector 8 mm-1/2“

1 - Metering line PTFE , 11 bar, 12 x 9 mm

1 - Micro-Matic coupling with flushing adapter (optional)

1 - Suction lance PVC 12 x 9 mm, 1.5 m

1 - Vapour recovery line PVC 8 x 5 mm, 1,5 m

Hydrazine metering system, 250 l

1 - ProMinent® metering pump Beta® BT5b0713NPE0000UA004100, capacity 11.0 l/h at max. back pressure 7.0 bar. You can find more detailed information in your operating instructions.

1 - ProMinent® metering pump Beta® BT5b0232NPE0000UA004100 , as decanting pump, capacity 32.0 l/h at max. back pressure 2 bar. You can find more detailed information in your operating instructions.

1 - PE chemical feed container, volume 250 l, with litre scale and closable screw lid, "gas-tight version"

1 - Complete PVC suction assembly, "gas-tight version" (installed in the chemical feed container)

1 - Electrical level switch with support pipe (installed in the chemical feed container)

1 - PVC manual stirrer, "gas-tight version"

1 - Fastening plate for mounting the metering pumps on the container

1 - Metering container, PVC-transparent, volume 5 l, with electrical level switch for switching off the decanting pump upon reaching of a high level as well as the necessary hoses

1 - Active carbon filter

1 - PVC ball valve, d16, NW10 with piping

1 - 1.4571 stainless steel injection valve , connector 12 mm-1/2“

1 - Metering line PTFE, 11 bar 8x5 mm, 5 m

1 - Micro-Matic coupling with flushing adapter (optional)

1 - Suction lance PVC 12 x 9 mm, 1.5 m

1 - Vapour recovery line PVC 8 x 5 mm, 1,5 m

Chemical feed container, complete

PE chemical feed container, gas-tight screw lid, gas-tight PVC manual stirrer, transparent PVC metering container with drainage cock, connectors for filling line, vapour recovery line, aeration and venting, with active carbon filter 1.0 l, diluting water line with stopcock, all connectors PVC gas-tight, water line connector R 1/2".

Injection valve

1.4571 stainless steel injection valve, with support insert for connection to a stainless steel line:

- 8 mm - for 140 l system
- 12 mm - for 250 l system

The injection valve is equipped with a 1/2" nipple for fixing to the point of injection.

Coupling for storage tank (e.g. Micro-Matic)

The coupling has hose nozzles for the decanting pump and the vapour recovery line.

18 Spare parts and accessories

18.1 Spare parts

Dosing system 140 l (part no. 913018)

For metering pump Beta® BT4b0708NPT0000UA004100:

Description	Part no.
Beta® BT4b0708NPT0000UA004100 without venting	1036869
Dosing head with suction/discharge connectors, without diaphragm, without connector kit	1034458
Connector kit 8x5	1035641
Metering diaphragm 46.0x21.5	1000248
Discharge valve, compl. 9.2-2 PCE	1021690
Suction valve, compl. 9.2-2 PCE	1021677

For transfer pump Beta® BT5b0420NPT0000UA004100:

Description	Part no.
Beta® BT5b0420NPT0000UA004100 without venting	1036868
Dosing head with suction/discharge connectors, without diaphragm, without connector kit	1034460
Connector kit 12x9	1035642
Metering diaphragm 70.0x33.5	1000250
Discharge valve, compl. 9.2-2 PCE	1021690
Suction valve, compl. 9.2-2 PCE	1021677

Miscellaneous parts:

Description	Part no.
Active carbon filter (incl. 500202)	809819
Metering container, 2 l	809860
Manual stirrer, 140 l	809803
Micro-Matic coupling	1003964

Dosing system 250 l (part no. 913019)

For metering pump Beta® BT5b0713NPT0000UA004100:

Description	Part no.
Beta® BT5b0713NPT0000UA004100 without venting	1037109
Dosing head with suction/discharge connectors, without diaphragm, without connector kit	1034461
Connector kit 8x5	1035642
Metering diaphragm 55.0x26.0	1000249
Discharge valve, compl. 9.2-2 PCE	1021690
Suction valve, compl. 9.2-2 PCE	1021677

For transfer pump Beta® BT5b0232NPT0000UA004100:

Description	Part no.
Beta® BT5b0232NPT0000UA004100 without venting	1037108
Dosing head with suction/discharge connectors, without diaphragm, without connector kit	1034461
Connector kit 12x9	1035642
Metering diaphragm 91.0x46.0	1000251
Discharge valve, compl. 9.2-2 PCE	1021690
Suction valve, compl. 9.2-2 PCE	1021677

Miscellaneous parts:

Description	Part no.
Active carbon filter (incl. 500202)	809819
Metering container, 5 l	809861
Manual stirrer, 250 l	809813
Micro-Matic coupling	1003964

18.2 Accessories

For all dosing systems

Description	Part no.
High alloy steel discharge kit	1003964
Collecting pan 200 l with design certification and galvanized grid	on request
Collecting pan 1000 l with design certification and galvanized grid	on request

19 Appendix

19.1 Dimension sheets

DULCODOS® Hydrazin 140 l

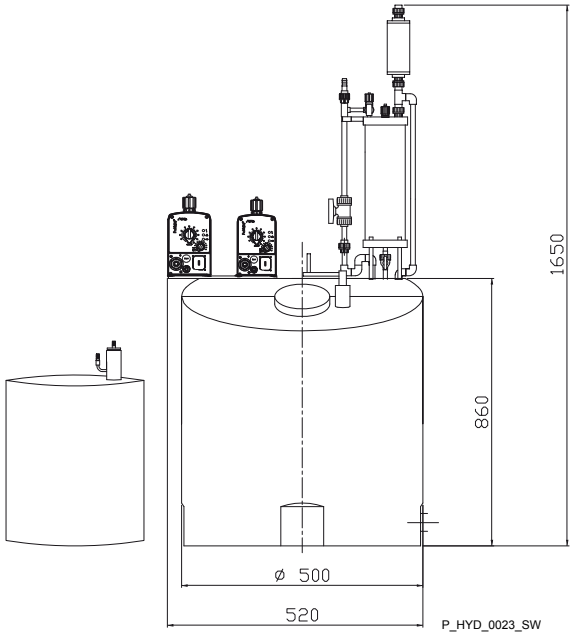

Fig. 9: Dimensional drawing Hydrazin 140 l (dimensions in mm)

DULCODOS® Hydrazin 250 l

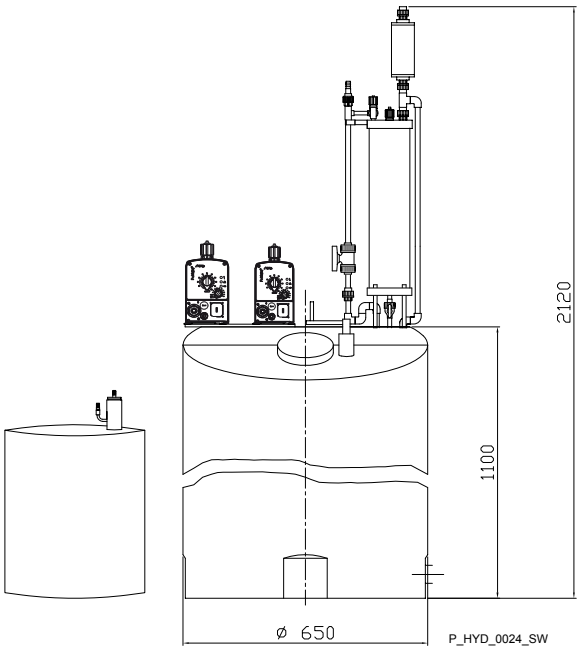

Fig. 10: Dimensional drawing Hydrazin 250 l (dimensions in mm)

19.2 EC Declaration of Conformity

EC Declaration of Conformity

We hereby declare,

ProMinent Dosiertechnik GmbH
Im Schuhmachergewann 5 - 11
D - 69123 Heidelberg

that the following designated product complies with the pertinent fundamental safety and health requirements of the EC Directive in terms of its design and construction and in terms of the version marketed by us.
This declaration loses its validity in the event of a modification to the product not agreed with us.

Description of the product:	***Dosing plant Hydrazin***
part number:	***913018*** ***913019***
Pertinent EC Directives:	***EC Machinery Directive (2006/42/EC)*** ***EC Low Voltage Directive (2006/95/EC)*** ***EC EMC Directive (2004/108/EC)***
Applied harmonised standards in particular:	***EN ISO 12100-1, EN ISO 12100-2, EN 809,*** ***EN 60335-1, EN 60335-2-41, EN 50106, EN 55014,*** ***EN 61000-3-3, EN 61000-4-2/3/4/5/6/11, EN 61000-6-1/2***
other technical specifications used, in particular :	***BGG 907***
technical documents have been compiled by:	***Norbert Berger*** ***Im Schuhmachergewann 5-11*** ***DE-69123 Heidelberg***
Date / Manufacturer - Signature :	*04.01.2010*
Details of the signatory:	*Joachim Schall, Head of Research and Development*

19.3 Decontamination declaration

Declaration of Decontamination

(see download: www.prominent.com)

Because of legal regulations and for the safety of our employees and operation equipment, we need the „declaration of decontamination", with your signature, before your order can be handled.
Please make absolutely sure to include it with the shipping documents, or – even better – attach it to the outside of the packaging.

Please return your products to:	

Type of instrument / sensor: _____ **Serial number:** _____
Gerätetyp: Seriennummer:

Process data: Temperature: _____ [°C] Pressure: _____ [bar]
Prozessdaten: Temperatur: Druck:

Mediums and warnings:
Warnhinweise zum Medium:

	Medium/ Concentration Medium/ Konzentration	**Identification** CAS No.	**flammable** entzündlich	**toxic** giftig	**corrosive** ätzend	**harmful/ irritant** gesundheitsschädlich/reizend	**other*** sonstiges*	**harmless** unbedenklich
Process medium Medium im Prozess								
Medium for process-cleaning Medium zur Prozessreinigung								
Returned part cleaned with Medium zur Endreinigung								

* explosive; oxidising; dangerous for the environment; biological risk; radioactive
* explosiv; brandfördernd; umweltgefährlich; biogefährlich; radioaktiv

Please tick should one of the above be applicable, include security sheet and, if necessary, special handling instructions.

Reason for return:

Company data:

Company:	_____	Phone number:	_____
Contact person:	_____	Fax:	_____
Street:	_____	E-Mail:	_____
Address:	_____	Your order No:	_____

"We hereby certify that the returned parts have been carefully cleaned. To the best of our knowledge they are free from any residues in dangerous quantities."

_____ _____
Place, date Company stamp and legally binding signature

Fig. 11

19.4 Acceptance test certificate

ACCEPTANCE TEST CERTIFICATE DULCODOS® Hydrazin

Serial number

Project number / customer order

Custom

(Tick where applicable)

Initial commissioning in accordance with BBG-907, updated version 1999

Cyclic testing in accordance with BBG-907, updated version 1999

Layout and installation of the hydrazine metering system corresponds to BBG-907 /1999?	yes ☐	no ☐
Does the installation of the hydrazine metering system correspond to the current state of the art?	yes ☐	no ☐
Does the labelling of the hydrazine metering system correspond to BGI-567 and M 011?	yes ☐	no ☐
Does the function of the hydrazine metering system correspond to BGI-907 /1999?	yes ☐	no ☐
Does the leak test for the hydrazine metering system correspond to BGI-907 /1999?	yes ☐	no ☐
Is the operator of the hydrazine metering system in possession of a set of operating instructions?	yes ☐	no ☐
Can the hydrazine metering system be started?	yes ☐	no ☐
Can the hydrazine metering system remain in normal operation?	yes ☐	no ☐

Remarks: _____

Operator: _____

Plac _____ Date: _____

Signature operator: _____ Signature technical expert: _____

Original for operator / carbon copy for ProMinent Dosiertechnik GmbH

Notice: 10068/001 created: Bannas tested: Bannas changed: Page 1 of 1
Document: 82 05-401 00 07-TB A1D-01 (AbnahmeDrkoll deu Hydrazin) Date: 2010-06-02 Time: 10:24

ProMinent Dosiertechnik GmbH, P.O. Box 10 17 60, D-69007 Heidelberg - Germany

19.5 Technical Data for hydrazine / levoxine 15%

WARNING!
This summary does not replace the safety data sheet of the supplier!

CAUTION!
These data do not guarantee particular properties.

Chemical characterisation

hydrazine solution contains 24% hydrazine hydrate, corresponding to 15% hydrazine

CAS number: 302-01-2

EINECS number: 206-114-9

Possible product hazards

Can be carcinogenic.

Also hazardous in the event of inhaling, swallowing and contact with the skin.

Causes chemical burns.

Sensitising possible in the event of contact with the skin.

Highly toxic for water organisms, can have long-term harmful effects in water bodies.

First aid measures

General information:

Remove those affected from the danger area and lay them down.

Symptoms of poisoning may only become apparent after several hours, for this reason, medical monitoring is required for at least 48 hours subsequently to an accident.

After inhalation:

Provide fresh air, arrange for medical help.

If there is a danger of loss of conciousness lie down and transport in a steady position on their side. Keep affected person warm and calm.

After contact with the skin:

Immediately remove any clothing contaminated with the product.

Wash off affected areas immediately with water and soap then rinse with plenty of water.

Arrange for medical attention for the affected person.

After contact with the eyes:

Rinse open eyes under running water for several minutes and consult a doctor.

If swallowed:

Immediately consult a doctor.

Immediately bring the affected person to a hospital.

Firefighting measures

Suitable extinguishing agents:

Water

Particular hazards arising from the product itself, its combustion products or the resultant gases:	The following can be released due to a fire: Ammonia, nitrous oxides (NOx), hydrogen.
Special protective equipment required for fire fighting:	Wear self contained breathing apparatus. Wear safety clothing.

Measures for unintentional release

Personal protective measures:	Wear protective equipment. Keep unprotected persons away from the area.
Environmental protection measures:	Do not allow to drain into the sewerage system or environment.
Process for cleaning / collection:	Rinse small amounts with copious amounts of water. Dispose of waste water environmentally. Capture with liquid binding materials (sand, diatomaceous earth, universal binder). Feed into suitable storage tanks for disposal. Dispose of contaminated material according to the locally applicable waste disposal legislation and regulations.
Additional information:	Break down hydrazine in waste water with sodium hypochlorite or catalytic oxidation.

Handling and storage

Handling:

Instructions on safe handling:	Only transfer and handle the product within the closed system. Ensure good ventilation of the work area.
Information concerning fire and explosion protection:	Store cool and dry in well sealed containers. Store under lock and key or only accessible for technical experts and persons commissioned by them.

Storage

Requirements for storage rooms and tanks:	Store cool and dry in well sealed containers. Store under lock and key or only accessible for technical experts and persons commissioned by them.
Instructions for storage with other substances:	Observe the regulations for storing products together. Do not store with oxidising agents or acids.

Limiting exposure and personal protective equipment

General protection and hygiene measures:	Keep the product away from foodstuffs, drink and animal feed. Do not eat, drink or smoke when working. Wash hands before breaks or when work is completed.

Respiratory protection:

For short-term or reduced chemical loading, a respiration filter device will suffice; for intensive use or long-term loading, use a self contained breathing apparatus.

Recommended filter type: K (identification colour green)

Hand protection:

Wear suitable safety gloves for the activity and product. Ask the manufacturer which safety gloves are suitable.

Replace safety gloves regularly.

Eye protection:

Tightly fitting safety glasses

Body protection:

Safety clothing

Physical and chemical properties

Specification	value
Form:	Liquid
Colour:	Colourless
Odour:	Ammonia, pungent
Solubility:	Completely soluble, mixable with water

Data	Value	Unit
pH value (150 g/l at 20 °C)	11.9	
Melting point/melting range:	-14	°C
Boiling point/boiling range:	102.2	°C
Vapour pressure (at 20 °C):	20	hPa
Density (at 20 °C):	1,008	kg/l
Viscosity (dynamic at 20 °C)	1.04	mPa

Stability and reactivity

Pyrolysis / conditions to be avoided:

Do not overheat

Substances to avoid:

Oxidants, acids, heavy metal ions (including rust!) and finely distributed substances (such as active carbon, sawdust, etc.).

Dangerous decomposition products:

Ammonia, nitrous oxides (NOx), hydrogen.

Disposal information

Product:

Disposal according to the locally applicable waste disposal legislation and regulations.

Used packaging

Disposal according to the locally applicable waste disposal legislation and regulations.

Hazards and safety

Hazards	Can be carcinogenic. Also hazardous in the event of inhaling, swallowing and contact with the skin. Causes chemical burns. Sensitising possible in the event of contact with the skin. Highly toxic for water organisms, can have long-term harmful effects in water bodies.
Safety	Avoid exposure - obtain special instructions prior to use. Store in a well ventilated location. Do not eat or drink when working. Thoroughly rinse open eyes with plenty of water and consult a doctor. Wear suitable protective clothing, safety gloves, and safety glasses / face mask when working. In the event of an accident or if feeling unwell consult a doctor immediately (if possible, show him the label). This product and its storage tanks are to be disposed of as hazardous waste.